Cannabis and other drug use by tertiary students in Darwin, Northern Territory, Australia

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Abstract

Cannabis has been reported to be associated with impaired educational attainment in adolescents, reduced school performance and the potential for underperformance in adults engaged in occupations requiring high-level cognitive skills. The current study examined the extent and patterns of cannabis and other drug use among 386 tertiary students in Darwin, Northern Territory, Australia. The sample was mainly female (72%), half were aged under 25 years and 52% were in the first year of tertiary study. Cannabis use was prevalent among students, with 68.3% ever using it, 32.4% in the last year and 22.4% with recent use (last six months). The current pattern of cannabis use was significantly associated with age and gender. The most common reasons for using cannabis were to unwind (45.6%) or become stoned (33.7%). Close to half (52.3%) of recent users were not at all concerned about their cannabis use and 63.2% did not think they needed to reduce consumption. In the last six months, 84.5% of students had used alcohol, 12.1% amphetamine, 8.4% ecstasy, 6.8% non-medical use of benzodiazepines, 4.6% hallucinogens, 1.6% inhalants and 1.1% opiates. A quarter (23.6%) of students had used alcohol and cannabis on the same occasion. The results are discussed in relation to the utility of traditional awareness programs and the desirability of appropriate and credible intervention strategies.

Introduction

Worldwide, cannabis is the most widely consumed drug and there was a general trend toward greater use in 2000, with increases reported by the majority of countries in Europe, the Americas, Africa and Oceania (UNODCCP, 2002). The prevalence of cannabis use by young people in Westernised countries has increased markedly in the last decade, particularly in Australia where rates exceeded those in other industrialised societies from 1995 to 1998 (Lynskey & Hall, 1998; Williams & McAllister, 2001). The 2001 National Drug Strategy

Household Survey (NDSHS) indicated that while 12.9% of the general Australian population aged 14 years or more had used cannabis in the previous 12 months, 24.4% of the Northern Territory (NT) population had recently used it and this was much higher than any other jurisdiction in Australia (AIHW, 2002). Higher proportions of those aged 14–24 years had recently used cannabis (27.8%) than those aged 25–39 years (19.4%) or over 40 years (4.1%). In the NT, 37.0% of 14–24 year olds had recently used cannabis and, again, this prevalence was higher than in any other jurisdiction.

Widespread use of cannabis continues despite controversy surrounding practically every aspect of its use, including health (Hall & Solowij, 1999), mental health (Degenhardt, Hall & Lynskey, 2001; Hall, Solowij & Lemon, 1994; Rey, Sawyer, Raphael, Patton & Lynskey, 2002), youth suicide (Moffat, 1998), attention deficit disorder and attention deficit hyperactivity disorder (Anderson, 1999), cognition, memory and performance (Ehrenreichet al., 1999; Lynskey & Hall, 1998; Rickard, 2001; Toumbourou, 2002), early school leaving (Bergen-Cico, 2000; Brook, Balka & Whiteman, 1999; Ferguson & Horwood, 1997; Lynskey, Coffey, Degenhardt, Carlin & Patton, 2003), reduced school performance and lower educational and occupational attainment (Jeynes, 2002; Lynskey & Hall, 2000; Schuster, O'Malley, Bachman, Johnston & Schulenberg, 2001; Toumbourou, 2002), job instability in young adulthood and the potential for underperformance in adults in occupations requiring high-level cognitive skills (Hall & Solowij, 1999).

Given the possible implications of cannabis use on cognition and attentional functions and underachievement in occupations requiring high-level cognitive skills in young adults, it is surprising there is so little research on cannabis use in Australian tertiary students. In 1987, just over half a sample of Curtin University students had used cannabis and 13% used it more than a few times a month (Robinson, Yianni, Frizzell & Rehfeldt, 1989). In the Australian Capital Territory and Victoria in 1995, 53.4% of students had ever used cannabis, 39.8% used it in the previous year, 11% were weekly users and the mean age of initiation was 17 years (McGeorge & Aitken, 1997). A 1996 survey of New South Wales Technical and Further Education students found significant increases in the use of alcohol, cannabis and illicit drugs (ADCA, 1998). About two-thirds of students had tried cannabis and weekly use had increased from 7% to 24% in the four years from 1992 to 1996. A 2000 survey of NT tertiary students (O'Reilly, Carr, Bolitho, Roberts & Jessen, 2001) found 77.6% were current drinkers, 28.5% were current users of other drugs, 28.8% had used other drugs in the previous month (mean of 11 occasions) and 24.8% had used alcohol and another drug concurrently in the previous month. Nine in ten students had first used cannabis and the majority had liked their first experience of drug use.

O'Reilly et al. (2001) discussed the value of further research examining the patterns of cannabis use among tertiary students, particularly given the possible links with cognition, memory and performance. This research, therefore, aimed to examine the prevalence and patterns of cannabis and other drug use among Northern Territory University (NTU) students. The results will assist in determining if cannabis use is problematic among this group and whether intervention strategies are needed to increase the awareness among tertiary students of the effects of cannabis and the potential adverse effects on cognitive functioning, educational achievement and future occupational attainment.

Method

Participants

Survey participants were students enrolled in internal study programs at the Northern Territory University, situated in Darwin, NT, Australia in March 2002. Students were accessed from all faculties and year levels at the university. There were no restrictions on participation. In all, 386 students agreed to participate and completed the survey instrument.

Measures

The survey instrument was a self-completion questionnaire consisting of 50 closed questions in three sections: demographic details; history and patterns of cannabis use and attitudes to use; and non-medical use of licit and illicit drugs. Categorical questions collected demographic material on age, current living arrangements, income, university year level and health. The second section also predominantly used categorical questions to collect information on history of use, recent use, current pattern and frequency of use, reasons for use or non-use and likelihood of future use. A 10-point interval scale was employed to determine the level of concern about use, where a score of 1 was not at all concerned and 10 was very concerned about use. A categorical question then asked if they felt a need to reduce their level of cannabis consumption. Ratio level data were collected for age of first use and number of cones/joints for each day in the previous week. The questions relating to cannabis and other drug use were constructed to match items on existing datasets, such as the 2001 NDSHS (AIHW, 2002) and the Young People and Substance Use surveys in the NT (O'Reilly & Townsend, 1999).

Procedure

At the start of Semester 1, 2002, university lecturers received an email briefly explaining the study and requesting permission to attend the first 20 minutes of the first lecture of the semester. If permission was granted, the researchers attended the lecture, explained the nature and purpose of the study and provided students with a Participant Information Sheet and a Consent Form. Students who consented to participate then individually completed the questionnaire. Students generally completed the questionnaire in 15 minutes. The NTU Human Ethics Committee granted ethical clearance for this research.

Data analysis

Data were coded and entered into a Statistical Package for the Social Sciences (SPSS11) database. T test and one-way analysis of variance were employed to test for gender and age differences in age of initiation into cannabis use. Pearson's Chi-Square was used to test the level of association between age group and gender in variables that were nominal, such as ever used cannabis, recently used, current pattern of cannabis use, frequency of use, reasons for use or non-use in the last fortnight, concern about use, feeling the need to reduce consumption and the likelihood of using cannabis the next year.

Results

Sample Characteristics

Table 1 indicates the sample was predominantly female (71.7%), lived at home with either parents or a partner (69.3%) and had a usual income of less than AUD$300 per week (73.4%). Almost half of the students were aged less than 25 years (52.1%) and in the first year of undergraduate study (52.1%). When compared to the NTU population of 5,135 tertiary students at the time of the study, some differences emerged between the sample and the student body. In 2002, 64.6% of NTU students were female (71.1% in the sample), 76.5 % were undergraduate students (96.6% in the sample), 8.7% were aged less than 20 years

(versus 31.1%) and 36.9% were aged 35 years or more (versus 22.5%). Thus, the sample consisted of slightly more females, had an over-representation of both undergraduates and those aged less than 20 years and under-represented those aged 35 years or more. The other age groups were very similar.

Table 1

Demographic characteristics of the student sample (*N* = 386)

Sample Characteristics		%
Sex (male)		28.3
Age	19 years or less	31.1
	20–24	22.7
	25–29	14.1
	30–34	9.7
	35 or older	22.5
University Year Level	Undergrad year 1	54.0
	Undergrad year 2	29.3
	Undergrad year 3	8.5
	Undergrad year 4	4.8
	Postgraduate	3.4
Currently Live	Home-parents	34.6
	Home-partner	34.6
	On-campus	5.2
	Flat/house	23.7
	With relatives	1.9
Usual Income ($ per week)	Less than 50	8.9
	51–100	8.7
	101–150	13.4
	151–200	16.6
	201–250	13.9
	251–300	11.8
	300 or more	26.6

Cannabis Use History

Table 2 indicates the majority of students had used cannabis at some point in time (68.3%) and the average age of first use was 16.4 years. Older students were more likely to have tried cannabis, χ^2 *(5, N = 380) = 23.78, p = .001*, but the average age of initiation was significantly lower among younger students *F (4, 262) = 9.12, p = .001*. The mean age of initiation rose steadily across age groups and a post hoc Scheffe analysis indicated a significantly older mean age of initiation among those aged 35 years or more (*M = 18.6, SD = 6.60*) than all other age groups. Those aged less than 20 years also had a significantly lower age of initiation (*M = 14.70, SD = 1.64*) compared with those aged 25–29 years (*M = 16.82, SD = 2.35*). Significantly more females were non-users, ex-users or occasional users while more males were social or heavy users of cannabis: χ^2 *(5, 362) = 12.52, p = .03*. User status was significantly associated with age, χ^2 *(5, 377) = 41.33, p = .02*, with those aged 35 years or older more likely to be non-users. Social users were more likely to be aged less than 20 years while regular users were more likely to be aged between 25 and 29 years. All heavy users of cannabis were aged between 20 and 29 years.

Table 2
Cannabis use history of tertiary students, total sample and by gender

		Total N=386	Males N=109	Females N=277
Ever tried (%)	Yes	68.3	66.9	66.5
Age first used (mean years)		16.4 (SD 3.8)	15.8 (SD 2.2)	16.4 (SD 4.2)
Recent Cannabis Use (%)	Last 12 months	32.4	36.5	31.8
	Last 6 months	22.3	27.9	20.5
	Last 4 weeks	14.3	18.4	14.6
Cannabis Use Status (%)	Non-user	70.8	65.4	72.1
	Occasional user	17.1	15.4	24.8
	Regular user	3.2	3.8	3.1
	Social user	2.4	4.8	1.1
	Heavy user	1.3	3.8	3.4
	Ex-user	5.3	6.7	11.5
University Friends Use (%)	Most	4.6	9.2	3.1
	About half	8.1	7.1	8.7
	A few	46.1	44.9	46.5
	None	39.0	38.8	39.8

There was a significant association between age and recency of use, with those aged 35 years or more less likely to have used cannabis in the previous year χ^2 *(5, 380) = 19.42, p = .002* or in the last six months χ^2 *(5, 382) = 13.81, p = .02*. The 25–29 year age group had the highest proportion of students using cannabis in the previous 12 months (42.6%). Those who had used in the previous six months were more likely to be under 18 years of age or aged 25-29 years. No significant associations existed between gender and variables relating to recent use.

Patterns of Use Among Recent Cannabis Users
Among recent cannabis users (used cannabis in the last six months) a total of 33.3% smoked at least once a week or more, with 13.8% of these using it daily (Figure 1). Significantly more males than females reported frequent use of cannabis χ^2 *(6, 85) = 13.31, p = .04*, with 28.6% smoking on a daily basis compared to just 5.7% of females (5.7%). There were no significant associations between age group and frequency of cannabis use.
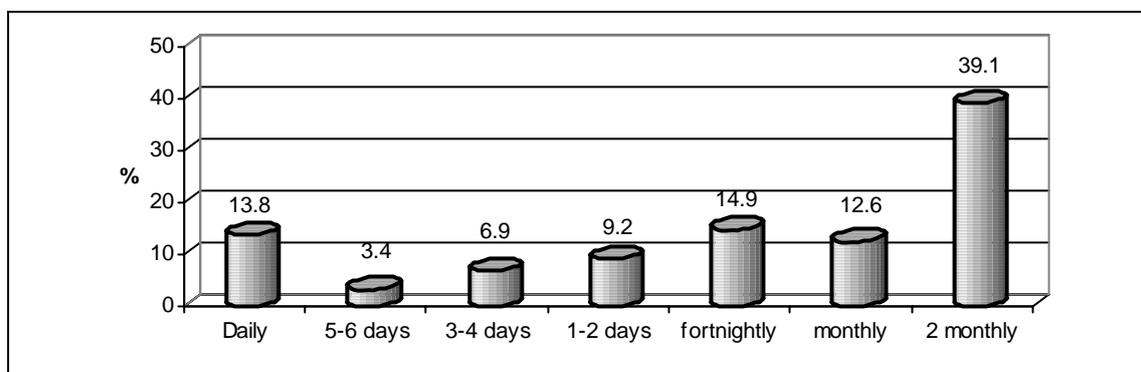

Figure 1. Usual frequency of cannabis use among recent users (%)

In the preceding week recent users were more likely to smoke cannabis over the weekend (Figure 2) and Figure 3 indicates the average number of cones/joints smoked per day was highest on Saturday (mean = 2.2; range = 1–20) and lowest on Tuesday (mean = 1.0; range = 1–15).
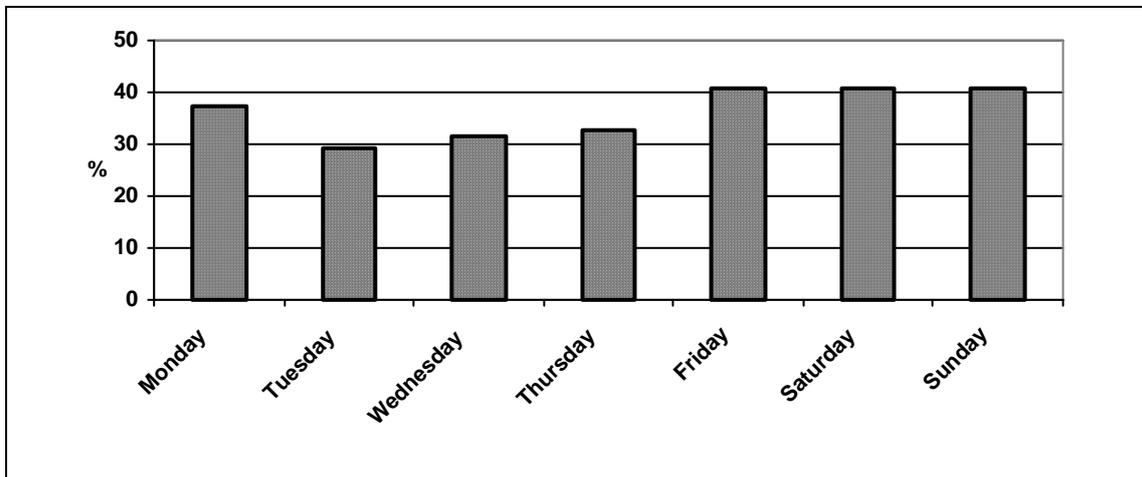

Figure 2 Proportion of recent users smoking cannabis each day of the week (%)
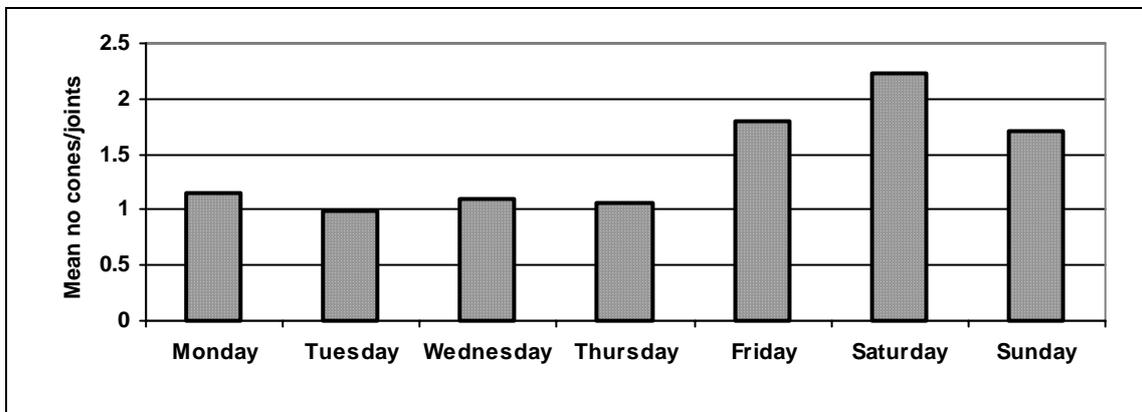

Figure 3 Mean number of cannabis smokes each day in week before the survey

From Figure 4 it can be seen that daily users averaged six cones/joints a day from Monday to Thursday in the week before the survey. The average number increased from nine cones/joints on Friday to 11 on Saturday. Near daily users (using five to six days a week) had an average of one to four smokes from Sunday to Friday and, like daily users, the highest quantity was used on Saturday (mean of seven cones/joints).
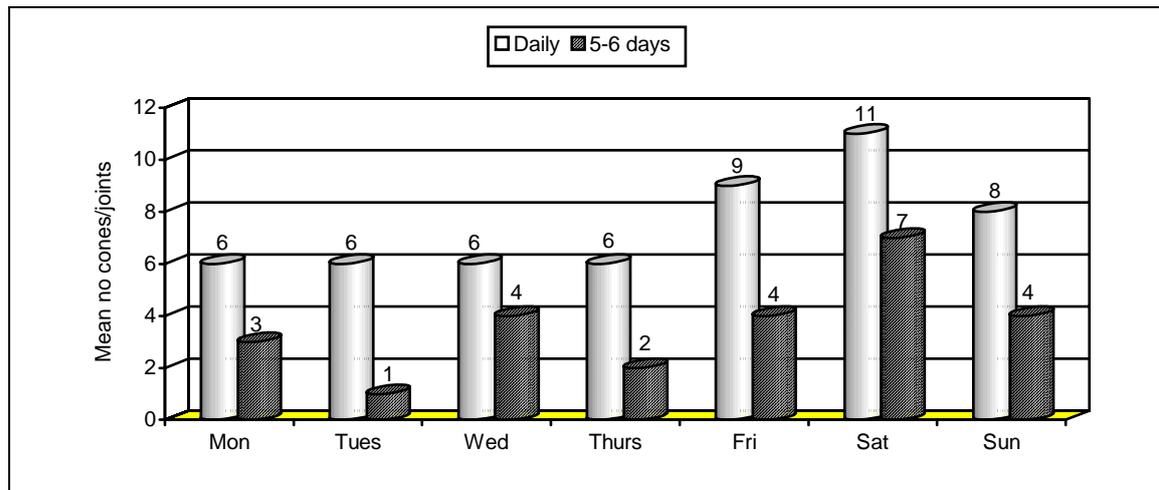
Figure 4 Mean number of cones/joints each day last week (daily and near daily users*)*

Reasons for Using Cannabis Last Fortnight

The most common reasons provided by recent users for using cannabis in the previous fortnight were to unwind (45.6%) or become stoned (33.7%). The next three most common reasons were associated with social settings, with 17.4% reporting friends visiting, 18.6% were at a party and 12.6% had gone out with friends. Very few recent users reported using cannabis for easing negative affect, to cope with a problem or because of their friends' expectations. There were no significant associations between age and reasons for use and only one significant gender association, with more males than females (14.3% : 0%) stating they had used cannabis because they felt sad or depressed, $\chi^2(1, 88) = 7.82, p = .005$. The majority of recent users (70.2%) stated the main reason they had not used cannabis in the last fortnight was because they had not felt like it. A small proportion (8.7%) had insufficient funds and only 5.3% thought it might affect their study. Other stated reasons were sport, moving, lazy, paranoia and a different mind state. There were no significant associations between age or gender and reasons for not using cannabis in the last fortnight.

Level of Concern About Cannabis Use

Recent users indicated their level of concern about their cannabis use on a scale from 1 ("Not at all Concerned") to 10 ("Very Concerned"). Just over half (52.3%) of recent users were not at all concerned with their cannabis use and 77.3% had a score less than 5 (M = 2.61, SD = 2.26). The majority (63.2%) did not think they needed to reduce their consumption. There was a significant correlation between concern about use and feeling the need to reduce cannabis use, $\chi^2 (9, 86) = 19.46, p = .01$. Predictably, the majority of those not concerned about their cannabis use did not feel the need to reduce their usage. No age or gender differences were detected.

Likelihood of Using Cannabis Next Year

Almost a third (32.6%) were unsure if they would be using cannabis the same time next year, 29.3% stated that it was unlikely or very unlikely and 7.9% were certain they would not to be using it. Of the remaining recent users, 22.4% stated they were likely or very likely to be using it and 7.9% were certain they would continue to use. There was no significant association between concern about use and likelihood of using cannabis the next year, nor were there any significant associations with age or gender.

Non-medical Use of Other Drugs

Table 3 indicates the vast majority of students (83.5%) had drunk alcohol in the previous six months. Three-quarters (75.8%) had consumed alcohol in the previous month and over half (57.1%) in the last week. In the preceding week, 1.4% of students had engaged in non-medical use of benzodiazepines and 6.8% in the last six months. Few students had used amphetamines in the previous month, but 12.1% had used them in the preceding six months. A similar pattern is evident with ecstasy and hallucinogens, with 8.4% using ecstasy and 4.6% using hallucinogens in the last six months. More students aged less than 24 years had used inhalants and ecstasy in the previous six months, while those aged 20–34 years were more likely to have used amphetamines.

Table 3
Frequency of non-medical use of drugs (n=386)

Drug Type	Last Week (%)	Last Month (%)	Last 6 Months (%)
Benzodiazepines	1.4	2.4	6.8
Alcohol	57.1	75.8	83.5
Inhalants	0.8	0.8	1.6
Amphetamine	0.8	4.1	12.1
Ecstasy	0.5	3.0	8.4
Opioids	0.0	0.3	1.1
Hallucinogens	0.3	1.1	4.6

Students reported on the frequency of concurrent use of cannabis and other drugs in the last six months and a quarter (23.6%) of students had used alcohol and cannabis on the same occasion. One in 20 had used amphetamine and ecstasy on the same occasion as cannabis and 3% had concurrently used cannabis and hallucinogens. Only 1% of students had used opiates and cannabis together.

Discussion

The large majority of tertiary students in this study had recently used alcohol and other drugs and the usage patterns were similar to those reported in the general NT population (AIHW, 2002) and among NT tertiary students in 2000 (O'Reilly et al., 2001). Non-medical use of amphetamine (12.1%), ecstasy (8.4%), benzodiazepines (6.8%) and hallucinogens (4.6%) in the last six months was higher than that reported in 2001 for the NT general population (6.3%, 2.8%, 1.1% and 1.7% respectively) (AIHW, 2002). When compared with age-equivalent counterparts no longer in the education system (O'Reilly & Townsend, 1999), a similar proportion aged less than 25 years had used amphetamine in the past six months, but it is encouraging that fewer had recent use of opiates, ecstasy and inhalants. It may be possible that continuing involvement in education provides some level of protection for youth, as indicated by studies reporting the higher the educational attainment the lower the likelihood of using cannabis and other substances (O'Malley & Johnston, 2002; Thies & Register, 1993).

Polydrug use was evident and a quarter of the students had used cannabis and alcohol on the same occasion in the previous six months. One in 20 students had also used cannabis with amphetamine or ecstasy in the preceding six months. O'Reilly et al. (2001) reported a quarter

of NTU students sampled had used alcohol and another substance concurrently in the previous month. These findings indicate the need to further explore polydrug use, given its association with increased health risks, such as the potential for toxicity and overdose. It is important that students are informed of strategies to reduce the harm associated with polydrug use and such strategies need to ensure this information is credible and accessible to a diverse range of people.

Although not completely equivalent in age characteristics, comparison with NT general population samples provides indications of broad similarities or differences in prevalence of cannabis use. Just over two-thirds of the sample of NTU tertiary students had lifetime use of cannabis and this was higher than the NT proportion of 59.1% in 1998 (Fitzsimmons & Cooper-Stanbury, 2000). The average age of initiation was 16.3 years, with a significantly lower age of initiation for younger students, and this was lower than the average age of 18.4 years in the NT in 1998 (Fitzsimmons & Cooper-Stanbury, 2000). This is of concern given reports of initiation before 16 years of age possibly producing enduring specific attentional deficits in adulthood (Ehrenreich et al., 1999). This may have implications for some students during their university years and in future occupations, where they may often be required to engage in complex and demanding cognitive tasks.

A third of students (32.4%) had used cannabis in the previous year and this was higher than the NT proportion of 24.4% in 2001 (AIHW, 2002). The proportion of both males and females using cannabis in the previous year was higher than the 2001 rates in NT general population (36.5% : 25.6% and 31.8% : 23.2% respectively). When the age groups were collapsed into under 25 years or not for comparison with the 2001 NDSHS, the under 25 year old students had the highest proportion using cannabis in the previous year (37.4% : 26.4%), and this was equivalent to the NT figure of 37.0% for this age group.

To further test the supposition that higher educational attainment is associated with a lower likelihood of using cannabis, the NTU sample aged less than 25 years was compared to an equivalent group in the NT that was not in the educational system. The prevalence of recent use of cannabis (last six months) was much lower among the sample of tertiary students aged less than 25 when compared with their counterparts not in the educational system (O'Reilly & Townsend, 1999). Overall, 51.4% (53% male and 49.7% female) of those aged less than 25 years and not in education had recently used cannabis compared to 22.5% (27.9% male and 20.3% female) of the tertiary students aged less than 25 years. This provides some further support to the claim that higher educational attainment may be associated with a reduced possibility of using some substances.

A third of recent cannabis users smoked weekly or more, with 17.2% using it on a daily basis or near-daily basis and males tended to use cannabis more frequently than females. The most common reasons for using cannabis were to unwind or become stoned and these are similar to those reported for a sample of NT tertiary students in 2000 (O'Reilly et al., 2001). Just over half of recent users were not at all concerned with their cannabis use and two-thirds did not think they needed to reduce intake. There were no significant association between concern about use and likelihood of using next year. This suggests that a level of concern about cannabis use may not necessarily produce the motivational impetus that translates into behavioural change consisting of an alteration of consumption levels.

These findings present some challenges in developing appropriate interventions. O'Reilly et al. (2001) reported most of the sampled tertiary students who had ever been intoxicated by substances enjoyed this first experience. The intent of a third of recent users in this study was

to become intoxicated by cannabis, suggesting the substance is consumed in anticipation of a positive effect and its use may have reinforcing properties. Obviously, messages portraying intoxication in a negative light will have little impact on those people desiring and enjoying such an effect. Health messages attempting to tap into concern about use in order to reduce consumption may also be of little value given the lack of association in the current study between concern about use and feeling the need to reduce consumption. Traditional information or knowledge-based programmes are based on the assumption that students' substance use is due to a lack of knowledge or awareness of health risks and that increased knowledge of the negative effects of substances will lead to a decrease in use. This may be a false assumption given substance users are likely to be aware of some of the risks and know through their own experience that very negative consequences are relatively rare given the proportion of others using cannabis. Additionally, young people often do not understand probabilities associated with risk and overestimate their capacity to alter behaviour before long-term consequences are likely to impact (DeJong & Winsten, 1998).

Informing students may not necessarily result in a reduction of use but there is evidence that it may result in harm minimisation (Aveyard, 1999; Wellings, Wadsworth, Johnson, Whitaker & Field, 1995). Ongoing information could be provided such that students make informed choices about substance use and, if they decide to engage in use, they do so with a minimum of harm. However, information giving would only be part of a more comprehensive strategy incorporating the development of supportive systems and policies to address substance use in higher education. Universities would need to identify ways in which the environment could be changed to eliminate or modify environmental factors that contribute to problematic use, protect students from harm, change student norms away from substance use and intervene with students showing evidence of problematic use. If universities are to invest in campus-based interventions then they will need sound evidence demonstrating which strategies work best under particular circumstances and which are the most cost effective. Formative research is required to assess the effectiveness of various strategies before consideration is given to investment in multifaceted approaches to address substance use in higher education.

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